

**REMARKS**

**I. Status of the Application**

Claims 1-9 are all the claims pending in the application. Claims 1-9 have been rejected. The present Amendment addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

**II. Claim Rejections Under 35 U.S.C. § 103(a)**

Claims 1, 2, 6, and 7 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 7,067,795 to Yan et al. (hereinafter “Yan”) in view of U.S. Publication No. 2002/0196497 to LoCascio et al. (hereinafter “LoCascio”). Claims 3-5 and 8-9 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yan in view of LoCascio and “Automatic polarization demultiplexer for polarization multiplexed transmission systems,” Proceedings of the European Conference on Optical Communication (ECOC), September 12, 1993, pages 401-404 by Heismann et al. (hereinafter “Heismann”). Applicants respectfully traverse these grounds of rejection.

Claim 1 recites:

A receiver for an optical time division multiplexed pulse train in which the pulses have alternating polarizations, the receiver comprising:

- a) a polarization insensitive optical switch for isolating optical pulses within the pulse train, and
- b) a polarization selective element for separating from the isolated pulses at least one component that has a single polarization.

In rejecting claim 1, the Examiner alleges that Yan discloses a polarization selective element for separating from the isolated pulses at least one component that has a single polarization. The Examiner cites Figs. 27 and 28 of Yan, which use polarization division multiplexing (PDM) to increase the spectral efficiency of dense-wavelength-division-

multiplexing (DWDM) systems (col. 13, lines 42-51). According to the Examiner, Yan discloses a WDM/PDM system. In contrast, claim 1 recites a receiver for an optical time division multiplexed (TDM) pulse train in which the pulses have alternating polarizations. The Examiner concedes that Yan fails to teach or suggest such a TDM/PDM system. However, the Examiner maintains that LoCascio discloses an optical TDM system with a receiver comprising a polarization insensitive optical switch for isolating optical pulses within the pulse train (Fig. 3; ¶ [0050]). The Examiner further alleges that a person of ordinary skill in the art would have recognized the possibility of modifying the WDM/PDM system of Yan to create a TDM/PDM system. The Examiner states that because WDM and TDM systems are well-known in the art, it would not require undue experimentation to convert a WDM multiplexing system into a TDM multiplexing system. Applicants respectfully disagree.

As a person of ordinary skill in the art understands, a TDM system divides a frame into multiple evenly-spaced time slots, and synchronously inserts a single bit of data from lower-bandwidth sources into a higher-bandwidth multiplexed stream (LoCascio, ¶ [0008]). An example of a pulse train in a TDM system is shown in Fig. 4 of LoCascio. The time domain is divided into recurrent time slots of a fixed length, and one data bit for each channel (1 and 2) is inserted within each time slot.

In contrast, a WDM system transmits multiple signals on a single fiber by using different wavelengths to carry different signals. Yan discloses that PDM can be used to increase the spectral efficiency of DWDM systems (col. 13, lines 44-49). In this case, two channels with the same wavelength have orthogonal polarizations (col. 13, lines 47-49; also see Heismann, first full paragraph). Yan uses a dynamic polarization controller followed by a polarizer to reduce polarization-induced crosstalk between the adjacent wavelength channels (col. 13, lines 53-56).

Applicants submit that modifying the WDM/PDM system of Yan to create the claimed TDM/PDM system would change the principle of operation of the WDM/PDM system of Yan. Yan addresses only linear polarized data signals, whereas the claimed invention addresses orthogonal polarized time-interleaved optical channels. As discussed above, WDM and TDM are completely different technologies that require different hardware for implementation. A WDM system carries different signals on different wavelengths, whereas a TDM system carries different signals on a single wavelength, but divides the time domain and inserts one data bit of each signal into each time slot. Therefore, switching from a WDM system to a TDM system would require a complete redesign of the entire system in Yan. Further, the Examiner has not provided any reason why a person of ordinary skill in the art would have been motivated to switch from a WDM system to a TDM system.

Accordingly, Applicants submit that claim 1 is patentable over Yan and LoCascio for at least the reasons discussed above. Because claim 6 contains features that are analogous to the features recited in claim 1, Applicants submit that claim 6 is patentable over Yan and LoCascio for analogous reasons. Further, claims 2 and 7 are patentable at least by virtue of their respective dependencies on claims 1 and 6, as well as for their additionally recited features. In addition, Heismann fails to remedy the deficient teachings of Yan and LoCascio. Therefore, claims 3-5, 8, and 9 are patentable over Yan, LoCascio, and Heismann at least by virtue of their respective dependencies on claims 1 and 6, as well as for their additionally recited features.

### **III. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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